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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,446	11/30/2001	Jorg-Thomas Zettler	101215-75	6307

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BRUCE LONDA
NORRIS, MCLAUGHLIN & MARCUS, P.A.
220 EAST 42ND STREET, 30TH FLOOR
NEW YORK, NY 10017

EXAMINER	
LYONS, MICHAEL A	
ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 08/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/998,446	Applicant(s) ZETTLER ET AL.	
	Examiner Michael A. Lyons	Art Unit 2877	

-- The MAILING DATE of this c mmunication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 10-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugawara et al (4,203,799) in view of Case et al (4,555,767).

Regarding claim 10, Sugawara discloses a method where, as epitaxial layers are grown on a substrate under constant processing conditions (such as implantation energy in claim 7 and temperature in claim 8), the thickness of the epitaxial layers is monitored "by the use of light received from the surface of said thin surface layer and from the surface of said insulating material region in the form of an interference waveform and controlling the reaction of epitaxial growth based on the obtained thickness information". Sugawara, however, fails to disclose the

explicit use of Fabry-Perot oscillations and the comparison of the measured interference waveform with a standard.

With regards to the use of Fabry-Perot oscillations, it is the position of the examiner that Fabry-Perot oscillations are created by interference by light reflecting off varying surfaces of the epitaxial growth layers, such as in Figure 1 of Sugawara. This interference can generate an interference waveform such as in Figure 3 of Sugawara, making the Fabry-Perot oscillations a functional equivalent to a normal interference waveform. Additionally, Case (abstract) states, in the process of measuring the thickness of an epitaxial layer, "the measured values of spectral reflectance are correlated with a series of theoretical reflectance values determined for different thicknesses of an epi layer in a range including the nominal thickness. The measured or actual epi thickness is determined from the correlation values." The measured values of the spectral reflectance will also generate an interference waveform (see Figure 3), with the correlation of the measured values with the standard values providing more accurate measurements of the growth layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the more refined measuring and calculation method of Case with the overall method of Sugawara in order to facilitate a more accurate measurement of the thickness of the epitaxial growth layers being built up using the method of Sugawara.

As for claim 11, the multi-layer material of Sugawara is a semiconductor (Col. 1, lines 18-25).

As for claim 12, the interference waveform is sinusoidal in Sugawara, thus generating an oscillation minimum to be utilized.

As for claims 13 and 18-21, Sugawara discloses a process temperature, time, composition, thickness, etc. in column 2, lines 33-56.

As for claim 14, Case discloses the use of reference values.

As for claim 15, normalizing a value is standard experimental practice.

As for claim 16, the step of stopping growth during a process to check the progress and accuracy of the material being built is standard experimental practice.

As for claim 17, Case measures values of spectral reflectance in order to make various measurements of the epitaxial layer.

Response to Arguments

Applicant's arguments with respect to claims 10-21 (original claims 1-9) have been considered but are moot in view of the new ground(s) of rejection as disclosed above. In particular, it is in the opinion of the examiner that the use of the term "Fabry-Perot oscillations" is functionally identical to the use of a standard interference waveform generated by light waves reflecting off of various surfaces of a multi-element material, with the interference being generated by the delay in the light traveling through different layers, each layer having a different refractive index, in the material. The different refractive indices slow down the light, generating the interference with the light reflecting only off of the surface of the material and remaining strictly in air, for example, when each light beam is detected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 703-305-1933. The examiner can normally be reached on Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G Font can be reached on 703-308-4877. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0725 for regular communications and 703-308-0725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0935.

MAL
August 18, 2003

Samuel A. Turner
Primary Examiner